

## Background

Yuba Water Agency (YWA; formerly known as the Yuba County Water Agency) has submitted an application for a special use permit to perform modifications to the Cottage Creek Dam, located on Cottage Creek approximately one-quarter mile upstream of New Bullards Bar Reservoir to resolve potential dam safety concerns. Cottage Creek Dam, which is owned and operated by the YWA, and the associated reservoir are partially located on National Forest System (NFS) lands within the Feather River Ranger District of the Plumas National Forest. Cottage Creek Dam currently functions to divert Cottage Creek flows around an existing maintenance yard, water treatment plant, adjoining parking lot, and the right abutment of New Bullards Bar Dam, while the reservoir, the impoundment upstream of the Cottage Creek Dam, serves as a backup water supply for New Bullards Bar Reservoir facilities. An inspection of Cottage Creek Dam in November 2015 determined that, although the structure remains intact and is not in danger of failing in the near term, there were potential issues regarding seepage, deterioration of the glory-hole spillway and erosion along the right abutment of the dam that were significant enough to warrant modifications to Cottage Creek Dam to resolve future potential dam safety issues.

## Proposed Project Location

Cottage Creek Dam is located in northeastern Yuba County, approximately 30 miles northeast of Yuba City, at an approximate elevation of 2,000 feet, on Plumas National Forest and YWA-owned land that is directly adjacent to the Tahoe National Forest. The Proposed Action is located in Sections 25 and 26 of Township 18 North, Range 7 East, as depicted on the Challenge 2000 United States Geological Survey 7.5-minute quadrangle (Mount Diablo Base and Meridian) (**Error! Reference source not found.**).

The project site is located adjacent to the Emerald Cove Marina and New Bullards Bar Dam and Reservoir. The parking lot, restrooms, and a water treatment facility associated with the adjacent marina and reservoir are located downstream of the Cottage Creek Dam, between the dam and New Bullards Bar Reservoir, and are located within the project site (**Error! Reference source not found.**). Access to the site is via County Road 169, which is located downstream of Cottage Creek Dam and upstream of New Bullards Bar Reservoir.

## Project Background

Cottage Creek Dam was constructed in 1966 as a zoned earth and rockfill structure, approximately 50 feet high, on Cottage Creek approximately 0.25-mile upstream of and near the right upstream abutment of New Bullards Bar Dam. The dam was designed by the same engineering firm (International Engineering Company of San Francisco [IECO]), with the same IECO civil engineer, and the same construction company (Perini Yuba Associates of Marysville) that designed and built New Bullards Bar Dam.

**The original purpose of Cottage Creek Dam was to support the construction of New Bullards Bar Dam by: (1) diverting Cottage Creek flows around the right abutment of New Bullards Bar Dam, thereby protecting the foundation work area of the main dam and the construction plant located along the north-west bank; and (2) providing a water supply for construction operations of New Bullards Bar Dam. Since completion of New Bullards Bar Dam, the Cottage Creek Dam functions to divert Cottage Creek**

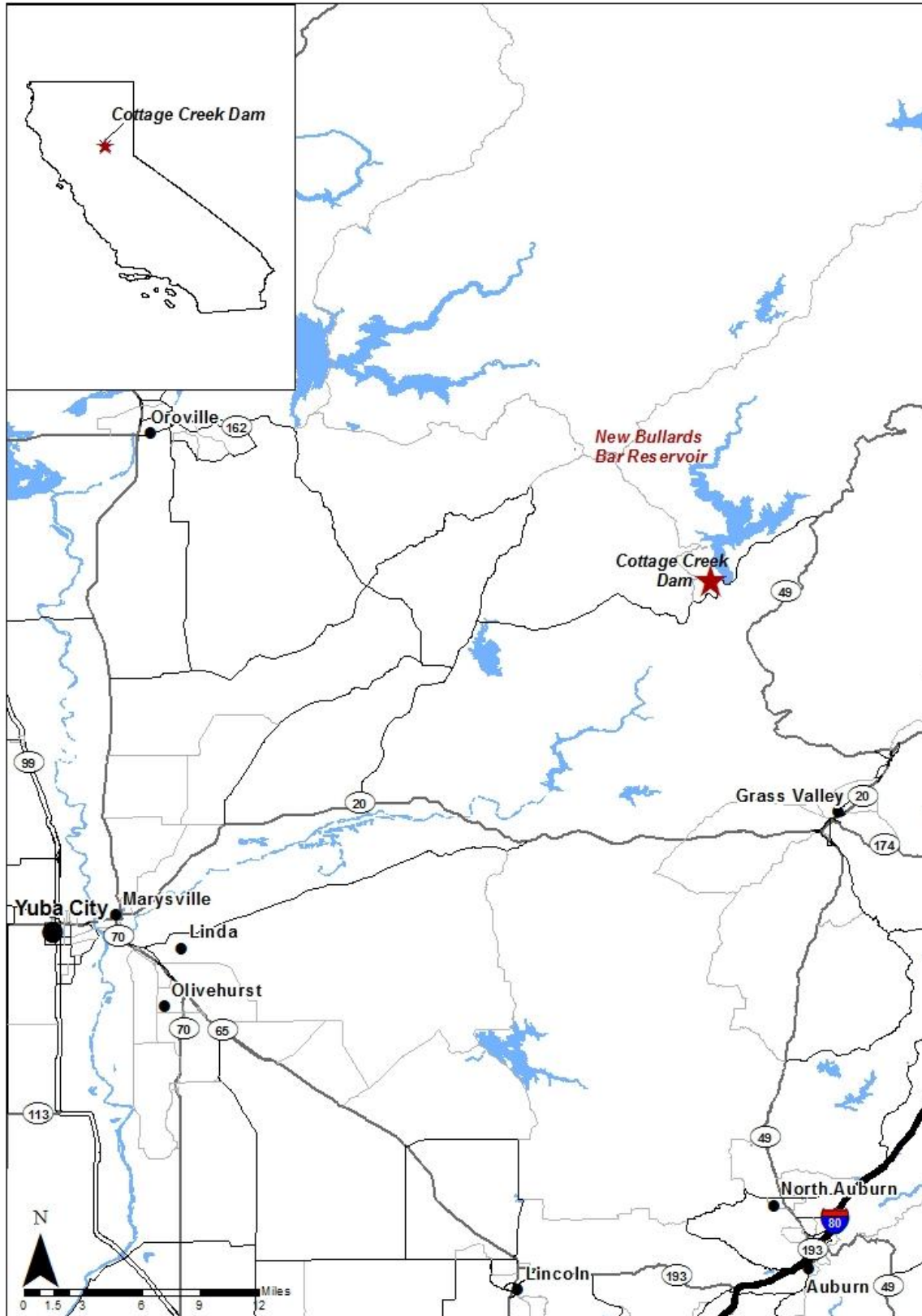
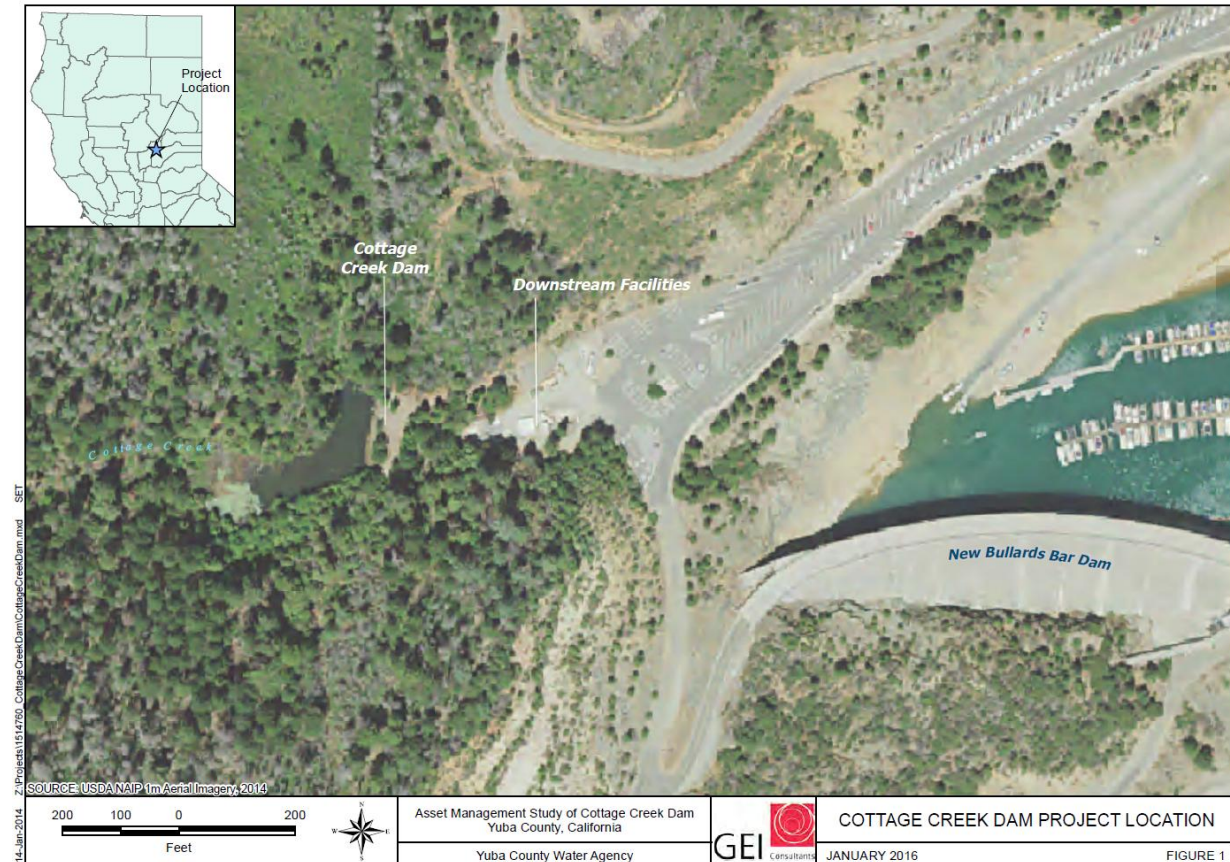


Figure 1. Cottage Creek Dam regional location map

flows around an existing maintenance yard, water treatment plant, adjoining parking lot, and the right abutment of New Bullards Bar Dam, while the reservoir serves as a backup water supply for New Bullards Bar Reservoir facilities. It was originally planned to be breached and removed after New Bullards Bar Dam was constructed and the creek re-diverted into New Bullards Bar Reservoir.



**Figure 2. Cottage Creek Dam Proposed Action location map**

Cottage Creek Dam is approximately 50 feet tall. Cottage Creek Reservoir, the upstream impoundment created by Cottage Creek Dam, is approximately one acre in size and impounds an estimated 11 acre-feet of water. Cottage Creek Dam has a low-level outlet works and a glory hole type spillway. The lower outlet is constructed from 24" spiral welded pipe. A 24" gate valve near the toe of the dam controls the flow from the lower outlet. An adapted reducer routes the flow from the 24" spiral welded pipe into a 6-inch PVC pipeline which passes through a second valve and discharges into an open channel drainage ditch that runs parallel with the parking lot. The glory-hole spillway is a 60-inch diameter corrugated metal pipe (CMP) that has a vertical drop inlet on the upstream face of the dam and emerges at the downstream toe, and then travels underground past the storage yard and water treatment facility, and discharges into the drainage ditch 300 feet downstream of the toe of the dam. The existing drainage ditch that runs along the parking lot entrance road (Road 169) is a trapezoidal shaped ditch that transports flows from the low-level outlet and glory hole spillway pipes and transfers them to a 60" CMP that runs beneath Road 169 and discharges into NBB Reservoir. During normal operations the lower outlet valve is closed and the reservoir level is maintained via overflow through the glory-hole spillway. The dam does not have an additional emergency spillway.

Construction of Cottage Creek Dam included extensive excavation of the project site. The lower outlet is located approximately 50 feet upstream and 50 feet below the elevation of the dam crest. Review of the original construction drawings show that excavation of the original soils would have occurred down to the elevation of the lower outlet prior to fill material being used to construct a 2.5:1 slope from the outlet to the dam crest. Excavation activities also occurred downstream of the dam during construction of the existing 60" CMP and drainage ditch.

Cottage Creek Dam does not fall under the jurisdiction of either the California Division of Dam Safety or the Federal Energy Regulatory Commission due to its small size and its small impoundment area of approximately 11 acre-feet at spillway crest.

Seepage of approximately five gallons per minute was discovered exiting the right downstream toe of Cottage Creek Dam in May 2015. While investigations found no immediate threat to public safety, a daily seepage monitoring plan was instituted and monitoring is on-going.

On November 17, 2015, a site inspection of Cottage Creek Dam was completed. The inspection included assessment of the dam, the upstream reservoir, the downstream water treatment facilities, the current seepage condition, and the downstream discharge path of the spillway. Based on the inspection, it was determined that the approximately 50-year old embankment dam remains intact despite the seepage issues. The following conditions were noted.

- The inlet of the dam spillway remained clear of debris and vegetation.
- The crest of the dam was generally clear from vegetation and trees.
- Trees and vegetation exist along the downstream and upstream slope of the dam, as well as the right and left abutment. Generally, trees range in diameter between 6 and 24 inches.
- Some tree fall was noted along the left downstream abutment and downstream slope of the dam.
- The hillside above the roadway along the right abutment of Cottage Creek Dam was near vertical and indicates sloughing below the root zone.
- Grout holes were noted along the crest of the dam at a spacing of approximately 10 feet.
- Seepage was noted along the spillway downstream of the dam (seepage measurements have been recorded manually since June 18, 2015, and indicate an average seepage flow of approximately five gallons per minute, although seepage levels increase and decrease with reservoir elevation).
- Seepage believed to originate from Cottage Creek appeared to drain along the old streambed/fill interface into New Bullards Bar Reservoir at the right abutment. This seepage was only noted due to an abnormally low New Bullards Bar Reservoir level. It is likely that this seepage has continuously occurred and is not a new occurrence.
- The 60-inch corrugated metal pipe spillway shows signs of rust on the inside lower one-third of the pipe based on observations from the downstream end and the spillway inlet.
- The downstream water treatment facility is located approximately 120 feet downstream of the dam toe and approximately 40 feet from the right downstream abutment of Cottage Creek Dam. The noted seepage has had no visible impact on the water treatment facilities.

Based on original engineering information, Cottage Creek Dam was meant to exist for only four years, with the dam to be breached and removed and the creek re-diverted into the newly created New

Bullards Bar Reservoir after construction of the New Bullards Bar Dam was completed. Instead, Cottage Creek Dam has been in service for nearly 50 years. Although there is no immediate threat to public safety, concerns regarding seepage, deterioration of the corrugated metal pipe spillway, and erosion along the right abutment of the dam have moved YWA to take action to prevent potential future dam safety issues.

## Purpose of Action

Several key issues contribute to the need for the modification of Cottage Creek Dam. These include potential issues regarding seepage, deterioration of the glory-hole spillway, and drainage issues. If left unaddressed it is expected that these issues would worsen over time causing the dam to further degrade. Eventually, this could lead to partial dam failure.

The dam has the effect of creating a pooled environment (i.e., the reservoir) within the otherwise lotic Cottage Creek. While the pooled environment previously provided some value to users, it creates an unnatural condition. The Proposed Action would convert the area that is currently Cottage Creek Reservoir into a more natural creek and wetland complex without any water impoundment.

## Need for Action

Because the dam and impoundment occurs on NFS lands and is not within the FERC license area YWA requested authorization to modify the dam structure and the resulting impoundment through application for a special use permit. Because it was built in support of the original FERC license the dam was not earlier authorized through a special use. The Forest Service plans to authorize modification of and future operation and maintenance of the Cottage Creek dam through issuance of a special use permit.

## Tribal Consultation

Local Indian tribal groups were mailed a hard copy letter on November 6, 2019, regarding the proposed Cottage Creek Dam Project.

- Mooretown Rancheria of Maidu Indians
- Estom Yumeka Maidu Tribe of the Enterprise Rancheria
- Strawberry Valley Rancheria
- T-si Akim Maidu
- United Auburn Indian Community of the Auburn Rancheria

## Proposed Action and Description

We propose to authorize Yuba Water Agency (YWA), through a special use permit the following:

Removing the existing corrugated metal pipe spillway and downstream culvert, excavating a portion of the dam down to a lower elevation, and installing a large concrete box culvert that would be sized to pass all Cottage Creek flows downstream past Cottage Creek Dam and into New Bullards Bar Reservoir.

Creation of new safer spillway at a lower elevation would result in significantly lower storage capacity behind Cottage Creek Dam and would result in the drainage of the existing Cottage Creek Reservoir.

Implementation of the Proposed Action is not expected to result in a net loss of jurisdictional waters. However, the types of jurisdictional waters are expected to change. The existing Cottage Creek Reservoir would no longer capture water, but water would continue to move through the area and the former reservoir would function as a wetland. The channels of Cottage Creek and the unnamed ephemeral channel that is a tributary to Cottage Creek and flows directly into Cottage Creek Reservoir would be re-established because they would no longer be inundated. The remaining areas that are currently open water would naturally convert to wetlands. Approximately 1,100 feet of Cottage Creek would be reestablished; at an estimated average width of 20 feet, this equates to 22,000 square feet (0.50 acres). Approximately 450 feet of the unnamed tributary would be re-established; at an estimated average width of 10 feet, this equates to 4,500 square feet (0.10 acres). Approximately 0.64 acres of open water would become a mixture of palustrine emergent and palustrine forested wetlands.

The portion of the dam embankment not impacted by the new box culvert would remain in place. The work would be designed with provisions for maintaining the existing water treatment facilities in service and conveying runoff from Cottage Creek downstream of the water treatment plant and recreation facilities.

The Proposed Action includes six major components:

1. mobilization;
2. clearing and grubbing;
3. rerouting Cottage Creek flows and dewatering the reservoir;
4. dam excavation and removal of existing corrugated metal pipe spillway and downstream culvert;
5. installation of concrete culvert; and
6. demobilization.

As described in the Project Background section above, construction of Cottage Creek Dam included extensive excavations, thus all construction activities associated with the Proposed Action, including necessary excavations and removal of existing infrastructure, would occur in soils that were previously disturbed during construction of the dam.

Each of the six construction components is described in detail in the following sections.

## Mobilization

### Mobilization will not occur on NFS lands.

Prior to the initiation of construction work, the contractor would define an area in the vicinity of the project site to store construction materials and equipment (i.e., the staging area). The location of the staging area would be determined by the contractor, but would likely be located within the parking lot of the Emerald Cove Marina facilities, located downstream of Cottage Creek Dam, which would eliminate potential impacts to vegetation and other resources. The staging area would be enclosed with construction fencing covered with a mesh screen to limit visibility to the site. Construction and

equipment staging and stockpiling would take place within the staging area and all materials would be stored above ground on platforms, skids or other supports. Mobilization is expected to take 1–2 days.

Contractor fuel trucks and fueling equipment would be parked at the storage yard and driven or transported to the work site for refueling purposes. All materials and equipment would be mobilized from the staging area.

## Clearing and Grubbing

Areas of the Proposed Action, including the dam face, are presently covered with trees and other native and ruderal vegetation, much of which would need to be cleared and grubbed prior to the initiation of construction activities. To prepare the site, an area of approximately 15,000 square feet would be cleared of all vegetable growth, such as trees logs, upturned stumps, roots of downed trees, brush, grass, and weeds, and all other objectionable materials within the limits of construction would be removed. The dam embankment would also be stripped of all trees that occur in the excavation footprint. A total of 141 trees occur within the clear and grub area, including ponderosa pine, incense cedar, big leaf maple, California laurel, sugar pine, black oak, madrone, Douglas fir, and toyan. Understory vegetation that would be removed include Himalayan blackberry and sword fern. The trees range in size from 2 to 18 inches in diameter.

Only five of the 141 trees to be removed are located on NFS lands, primarily because no vegetation would be removed from upstream of the dam. Access for the vegetation removal would be from the right abutment of Cottage Creek Dam. A D-5 dozer and an excavator would be used to remove vegetation. All vegetation removed from the project site would be chipped and hauled to YCWA's New Bullards Bar spoils pile for future use. The spoil pile site is located approximately 2.5 miles from the project site.

Clearing the site would also require removing 4,000 cubic feet of existing asphalt from the parking lot located downstream of the dam (non-NFS lands) by using a pavement cutter or other similar equipment to prepare for spillway removal. All asphalt removed from the project site would be taken off site to an approved disposal site. Vegetation and asphalt removal is expected to take approximately 2–4 weeks.

## Rerouting Cottage Creek Flows and Dewatering the Reservoir

These activities would take place on both NFS and non-NFS lands.

Prior to modifying Cottage Creek Dam, Cottage Creek flows would be rerouted around Cottage Creek Reservoir. During construction there would need to be precautions to keep water from the construction area. Due to the geography of the site, the only option for diverting Cottage Creek is to install a temporary bypass pipe to move water from Cottage Creek around Cottage Creek Reservoir and Dam and directly into New Bullards Bar Reservoir. The pipe would be designed to accommodate necessary temporary diversion sizing parameters including; tributary area, imperviousness, project duration, safety factor, and seasonal sizing coefficient. Since the creek upstream of the reservoir and the reservoir are significantly higher in elevation than New Bullards Bar Reservoir the use of pumps should not be necessary to convey the water downstream into New Bullards Bar Reservoir. The pipe would be sized to accommodate the design flow using no more than 80 percent of the pipe full flow capacity. A Manning's n value would be chosen based on the type of pipe material that would be used (i.e., concrete or



corrugated metal). Points of tie-in the natural channel would be protected with appropriately sized riprap.

The sequence for stream flow diversion would be as follows:

1. Install flow conveyance pipes, but do not divert flow.
2. Install upstream barrier that channelizes flows into a size and diameter equal to the conveyance pipe.
3. Allow water to flow through the barrier until ready to divert creek flows.
4. Connect conveyance pipe to upstream barrier.

Once flows from Cottage Creek are diverted around the reservoir and into New Bullards Bar Reservoir, Cottage Creek Reservoir would be dewatered using the low-level outlet in order to initiate construction activities on the dam. The low-level outlet runs from the reservoir low-point upstream of the embankment to the downstream drainage ditch that runs along Road 169, and then into New Bullards Bar Reservoir.

The sequence for reservoir dewatering would be as follows:

1. Slowly reduce the water level of the reservoir by one-third.
2. Inspect any dewatered areas for stranded and trapped fish and remove them with dip nets.
3. Slowly reduce the water level of the reservoir by another one-third of the original volume.
4. Again, inspect dewatered areas for stranded and trapped fish and remove them with dip nets.
5. Reduce the water level to a small ponded area and seine and dip net any stranded fish.
6. If water remains within the dewatered area; seine and dip net the project area until catch rates have reached no fish for three consecutive passes.
7. Allow the reservoir to drain completely and check substrate for remaining fish.

Fish relocation would only be performed by qualified fisheries biologists who have experience with fish capture and handling. The fisheries biologist shall be present onsite during the entire process of dewatering activities. The fisheries biologist would measure air and water temperatures throughout the fish relocation process to ensure water temperatures do not exceed 18°C. Fish capture methods would include seining and dip netting. Seines would have a mesh size that is appropriate to ensure entrapment of residing fish and age classes. Fish handling would be kept to a minimum, but if fish handling is necessary the biologist would wet hands prior to touching the fish. Fish would be held in a container (five gallon minimum to prevent overcrowding) with water temperatures not to exceed the temperature of creek waters. Two containers would be available to segregate young-of-the-year fish from larger fish to avoid predation. The containers would be continuously aerated with a battery-powered external bubbler, kept in the shade, and have a lid. For all captured fish, the fisheries biologist would record species and year-class. Fish would be retained for the shortest possible time to ensure stress is minimized and then be placed into New Bullards Bar Reservoir.

## Excavate Dam and Remove Existing Corrugated Metal Pipe Spillway and Downstream Culvert

These activities would take place on both NFS and non-NFS lands.



Removal of the existing infrastructure would follow a stepwise process beginning at the dam and finishing with removal of the downstream culvert. Prior to infrastructure removal the upstream pond would be dewatered through the existing toe of the dam. Dewatering operations would continue to occur after the dam is excavated by rerouting all water entering the excavation area around the construction activities. Water would be rerouted to New Bullards Bar Reservoir in a manner that prevents damage to adjacent property and pipe trenches in conformance with all local regulations.

After initial dewatering of the upstream pond, a portion of the dam embankment would be permanently removed at the right abutment to allow installation of the new box culvert at a lower elevation than the current glory hole spillway. Excavation into the south slope of the dam face is expected to encounter the rock abutment, at which point the excavation would follow the abutment slope. The excavation is expected to remove approximately 16,000 cubic yards of soil and 1,500 cubic yards of rock. A final design slope of the excavated dam face is expected to be at a ratio of 2 horizontal to 1 vertical (2H:1V) from an elevation of 2,052 feet (National Geodetic Vertical Datum [NGVD] 29), and not steeper than 2.5H:1V from an elevation of 2,052 feet to 2,082 feet (NGVD 29).

After dam excavation is complete the existing corrugated metal pipe spillway and downstream culvert would be removed. First the riser inlet including the trashrack and relevant appurtenances would be removed. Then, to access and remove the existing underground 60-inch corrugated metal pipe culvert and culvert crossing underneath County Road 169, a trench would be excavated.

Dewatering, excavation and infrastructure removal would take approximately 4–5 weeks. The right abutment and downstream face of the dam would serve as an access route for all of the excavation and removal activities. An excavator or similar type of equipment would be used to excavate the right abutment of the dam. An excavator equipped with a rock bit would be used to break up concrete surrounding the 60-inch corrugated metal pipe. Then a crane would be used to remove the pipe segments. Excavated materials from the dam would be used to backfill the culverts or hauled off site with haul trucks. The removed piping would either be salvaged or hauled off site with haul trucks.

## Install Concrete Culvert

These activities would take place on both NFS and non-NFS lands.

Prior to culvert installation the trench would be subgraded with controlled low strength materials or another approved base. Geotextile fabric would be added to the trench prior to culvert installation. The length of open trench would be limited to 600 feet in advance of pipe laying.

A precast 600 feet long, 8-feet by 8-feet concrete box culvert pipe with a headwall extending 5 feet above the structure would be installed in the subgraded trench. Box culvert corners would then be cast in place. The concrete culvert would extend from the upstream toe of the dam, which is located below the ordinary high water mark, to County Road 169. Prior to concrete placement, all water would be properly cut off or diverted by pipes or other means. The concrete culvert would be installed with the use of mechanical vibrators to eliminate rock pockets and voids and to ensure a smooth, dense and even texture. Vibrators would be used to consolidate the incoming concrete.

After the pipe has been bedded, pipe zone material would be placed simultaneously on both sides of the pipe. Material would be placed around the pipe so that the pipe barrel is completely supported and no

voids or uncompacted areas are left beneath the pipes. Then the area would be backfilled with a portion of available fill from dam excavation (6,000 cubic yards) and imported materials (550 cubic yards) to protect the structure from landslides or tree falls. In addition, backfill on the dam would be added to a minimum of 2,055 feet in elevation, then graded to a downstream slope that matches the existing embankment slope (average existing embankment slope is 2H:1V) to ensure stable slopes downstream of the dam. Backfilling would be completed by using large dump trucks (9 Yard trucks) to transport backfill, then a bulldozer would be used to compact the material. Dewatering operations would operate continuously to remove and dispose of all water entering the backfill area.

The box culvert would also replace the culvert previously crossing under County Road 169. To restore County Road 169 asphalt pavement sections (a total of 3,500 cubic feet of pavement), aggregate base and Portland cement concrete would be placed, followed by asphalt concrete material that would be installed with an asphalt concrete mat paving machine.

After installation of the culvert, the low-level outlet (24-inch pipe) of the dam would be removed and disposed of offsite. The Cottage Creek channel upstream of Cottage Creek Dam crest would be graded towards the box culvert inlet at a one percent slope. Then riprap would be installed upstream of the new box culvert's inlet slab to ensure that undermining of the slab does not occur. The riprap channel would be lined with cobbles and small boulders for a horizontal distance of 50-feet upstream. Finally, a trash rack would be installed on the upstream end of the box culvert.

Installation of the concrete culvert and associated work would take approximately three months. Various types of equipment would be utilized to complete this component of the Proposed Action. Equipment may include trucks for moving in concrete forms, a crane to place forms and precast box sections, and a concrete pump for concrete work and concrete trucks.

## Demobilization

These activities would take place on both NFS and non-NFS lands.

At the completion of the Proposed Action, general site clean-up and equipment removal from the work area would occur. These activities would include: removal of trash, debris, construction materials and weeds; regrading of staging and storage areas, if necessary; seeding and mulching the exposed earthwork; and removal of all temporary signage and fencing. Demobilization is expected to take approximately one week.

## Schedule

With favorable weather conditions, construction of the Proposed Action is expected to take approximately four to five months to complete and would be constructed from July to October 2020.

### Avoidance and Minimization Measures

The following avoidance and minimization measures (AMM) would be incorporated into YWA's project activities to assist in mitigating the potential environmental effects during construction. Table 1 summarizes the general AMMs.

Table 1. Summary of avoidance and minimization measures.

| Number | Title  | Summary   |
|--------|--|---|
| AMM 1  | Timing of-In Water Work                                      | Timing of construction would occur during the dry season. Construction activities would not occur at night.   |
| AMM 2  | Worker Training  | Construction personnel would undergo training and education on applicable environmental rules and regulations, and measures necessary to avoid or minimize effects to sensitive resources.  |
| AMM 3  | Construction Best Management Practices (BMPs) and Monitoring | Standard practices and measures that would be implemented prior to, during, and after construction to avoid or minimize impacts to water quality, aquatic habitat, and listed species.  |
| AMM 4  | Stormwater Pollution Prevention Plan                         | A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented for the Proposed Action. The SWPPP would contain measures to minimize pollutants in stormwater discharges during and after construction to prevent water quality degradation due to the Proposed Action. |
| AMM 5  | Erosion and Sediment Control                                 | Measures would be implemented to minimize short-term and long-term erosion, including utilization of straw wattles and other erosion protection measures.   |
| AMM 6  | Dispose and reuse of excavated materials.                    | Measures for handling, storage and disposal of excavated materials and dam infrastructure (i.e., glory hole).   |
| AMM 7  | Fish relocation plan   | Measures for fish relocation out of Cottage Creek Reservoir into New Bullards Bar Reservoir.  |
| AMM 8  | Environmental protection measures                            | Measures to ensure red legged frog and other species with the potential to occur at the project site are not impacted by the Proposed Action  |
| AMM 9  | Construction site clean-up                                   | Includes revegetation plan and removal of all construction equipment.   |

## AMM 1: Timing of Work

AMM 1 consists of the following measure related to the timing of in-water work.

- Access to the work site would occur during the working hours of 7:00 am to 6:00 pm Monday through Friday inclusive, excluding legal holidays.

## AMM 2: Worker Training

AMM 2 consists of the following worker training measure.

- All contractors and equipment operators would be given Worker Environmental Awareness Program (WEAP) training to make them aware of the ecological value of the site, including the potential for special-status species and their habitats to be present near the project site, and educate them on how to best avoid impacting the biota and aquatic resources including the lower Yuba River.

## AMM 3: Construction Best Management Practices (BMPs)

AMM 3 consists of the following construction BMPs.

- All stockpiling of materials would occur away from all Waters of the United States.

- Fueling, lubrication, maintenance, storage, and staging of vehicles and equipment would be conducted in a manner that would prevent discharges to any Waters of the United States.
- Fuel transfer vehicles would have absorbent pads, pillows, socks, booms or other spill containment materials placed under the fueling operation.
- Staging, and both temporary and long-term material disposal areas would be located away from Waters of the United States.
- Fuel transfers would take place at least 100 feet from exclusion zones, drainages and streams.
- Personnel involved in the Proposed Action would be trained in emergency response and spill containment techniques.
- Petroleum products would be stored in non-leaking containers at impervious storage sites from which runoff is not permitted to escape.
- Materials and debris from all work areas would be removed following completion of the Proposed Action.
- Fugitive dust would be minimized by watering or implementing other dust control measures.
- Fugitive dust would also be minimized by minimizing areas cleared (i.e., storage areas, staging areas, stockpile areas and vehicle parking), limiting construction vehicle speeds to 15 miles per hour or less, covering haul vehicles, installing wheel washers or other similar methods where vehicles exit the construction sites onto paved roads.
- A fire plan would be developed to include preventative measures, emergency procedures to be followed, current emergency telephone numbers, and an area map.
- No fires would be allowed.
- In extreme weather and/or when fuels are excessively dry, no chainsaw work would be conducted.

#### AMM 4: Stormwater Pollution Prevention Plan (SWPPP)

AMM 4 consists of preparation of a SWPPP pursuant to the State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ/NPDES Permit No. CAS000002). The SWPPP shall include specific BMPs to avoid and minimize impacts on water quality during construction activities. The goals of the SWPPP would generally be to protect water quality; establish procedures to minimize accelerated soil erosion; and minimize non-stormwater runoff. The SWPPP would define measures to prevent, control, and minimize impacts from a spill of hazardous, toxic, or petroleum substances during construction of the Proposed Action, as well as a description of potentially hazardous and non-hazardous materials that could be accidentally spilled, potential spill sources, potential spill causes, proper storage and transport methods, spill containment and recovery measures, agency notification, and responsible parties. Components of the SWPPP would generally include measures that limit risk of release of contaminants to waterways. The SWPPP would have the following primary objectives.

- Stabilization of the site as soon as possible.
- Protection of slopes and channels.
- Reduction of impervious surfaces and promotion of infiltration.
- Controlling the perimeter of the project site.
- Protection of all nearby receiving waters.

- Following all necessary pollution prevention measures.
- Minimization of the area and duration of exposed soils.

## AMM 5: Erosion and Sediment Control

AMM 5 consists of the following erosion and sediment control measures.

- All feasible avoidance and minimization measures would be implemented to control erosion and runoff from areas associated with construction activities.
- Install weed-free straw wattles, straw bales, weed-free fiber rolls or silt fencing, as necessary, to capture sediment.
- Install wind erosion control features (e.g., application of hydraulic mulch or bonded fiber matrix).
- Restore exposed earthwork with seed and mulch as soon as construction is complete

## AMM 6: Dispose and Reuse of Excavated Materials

AMM 6 consists of the following measures for disposal and reuse of excavation materials.

- A portion of the storage site would be set aside for the materials that would be used for backfill.
- Removed vegetative material would be chipped, stockpiled, and spread as mulch over the project site once earthwork is complete, when practical.
- The contractor would remove all debris, rubbish, and other materials that cannot be salvaged and dispose of them at an approved disposal site.

## AMM 7: Fish Relocation Plan

AMM 7 consists of the following measures for relocating any fish present in Cottage Creek Reservoir.

- Fish relocation would only be performed by qualified fisheries biologists who have experience with fish capture and handling. The fisheries biologist would be present onsite during the entire dewatering process.
- The fisheries biologist would measure air and water temperatures throughout the fish relocation process to ensure water temperatures do not exceed 18 degrees Celsius. Fish capture methods would include seining and dip netting.
- Seines would have a mesh size that is appropriate to ensure entrapment of residing fish and age classes.
- Fish handling would be kept to a minimum, but if fish handling is necessary the biologist would wet hands prior to touching the fish.
- Fish would be retained for the shortest possible time to ensure stress is minimized.

## AMM 8: Environmental Protection Measures

AMM 8 consists of the following measures to ensure protection of red legged frogs and other species with the potential to occur at the project site during construction.

- Optimal period for construction is during the dry season, June - September, when the frog is unlikely to be dispersing from adjacent critical habitat.

- To prevent inadvertent entrapment of animals during construction, all excavated, steepwalls, holes or trenches will be provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals, including the frog.
  - All trenches will be inspected every morning prior to commencement of work to make sure the frog, or other wildlife, are not in the trenches.
  - In the unlikely event that a frog or other wildlife is found in any trench, work will stop until it leaves on its own and before the commencement of construction activities.
- Pesticides will only be applied with Forest Service approval; in compliance with all federal, state and local regulations; and with the following conditions:
  - Do not apply herbicides within 300 ft of wetlands, riparian areas, or water features;
  - When applying herbicides between 300 and 500 ft of wetlands, use only wiping or wicking applications;
  - Do not spray herbicides within one mile upwind of any wetland or water feature;
  - Do not apply any herbicides if rainfall is predicted in the 5-day forecast; and
  - Do not apply herbicides within 150 ft of any ephemeral stream.

## AMM 9: Construction Site Clean-up

AMM 9 consists of the following construction site clean-up measures.

- The revegetation palette would not contain any plants listed on the California Invasive Plant Council Invasive Plant Inventory, which can be accessed online at <http://www.cal-ipc.org/ip/inventory/weedlist.php>.
- The USFS Native Plant Materials Policy (USFS 2012) will be followed for any erosion control or planting/seeding.
- All construction supplies, materials, and debris from the Proposed Action would be removed following completion of the Proposed Action.